Installation, Operation, and Maintenance

Integral Air-Cooled Self-Contained Unit

SCIJ — R-410A

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

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SXIJ-SVX01B-EN

Warnings, Cautions and Notices

Warnings, Cautions and Notices. Note that warnings, cautions and notices appear at appropriate intervals throughout this manual. Warnings are provided to alert installing contractors to potential hazards that could result in death or personal injury. Cautions are designed to alert personnel to hazardous situations that could result in personal injury, while notices indicate a situation that could result in equipment or property-damage-only accidents.

Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

Read this manual thoroughly before operating or servicing this unit.

ATTENTION: Warnings, Cautions, and Notices appear at appropriate sections throughout this literature. Read these carefully:

⚠WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE: Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns!

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs such as HCFCs and HFCs.

Responsible Refrigerant Practices!

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠WARNING

Proper Field Wiring and Grounding Required!

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state electrical codes. Failure to follow code could result in death or serious injury.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Installing/servicing this unit could result in exposure to electrical, mechanical and chemical hazards.

- **Before installing/servicing this unit, technicians MUST put on all Personal Protective Equipment (PPE) recommended for the work being undertaken. ALWAYS refer to appropriate MSDS sheets and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate MSDS sheets and OSHA guidelines for information on allowable personal exposure levels, proper respiratory protection and handling recommendations.**
- **If there is a risk of arc or flash, technicians MUST put on all Personal Protective Equipment (PPE) in accordance with NFPA 70E or other country-specific requirements for arc flash protection, PRIOR to servicing the unit.**

Failure to follow recommendations could result in death or serious injury.

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Introduction

Overview of Manual

This booklet describes proper installation, start-up, operation, and maintenance procedures for the Integral Air-Cooled unit, model SCIJ (with Micro-Channel Condensers). Carefully review the information within this manual and follow the instructions to minimize the risk of improper operation and/or component damage.

Note: *One copy of the appropriate service literature ships inside the control panel of each unit.*

Note: *This document is customer property and must be retained by the unit's owner for use by maintenance personnel.*

It is important that you perform periodic maintenance to help ensure trouble free operation. Should equipment failure occur, contact a qualified Trane service organization for an experienced HVAC technician to properly diagnose and repair this equipment.

Unit Nameplate

The unit nameplate identifies the unit model number, appropriate service literature, and wiring diagram numbers. It is mounted on the control panel door. Reference this information when making inquires or ordering parts or literature.

Revision Summary

Use this manual for Integral Air-Cooled units, model SCIJ (with Micro-Channel condensers).

SXIJ-SVX01B-EN (30 Jan 2014)

Removed coil resistant coating option from model number description.

SXIJ-SVX01B-EN (17 Apr 2012)

Modifications for 2-speed motor.

SXIJ-SVX01A-EN

This manual supersedes SXIH-SVX01C-EN (October 2008).

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Model Number Description

Digit 1 - Unit Model

S = self contained

Digit 2 - Unit Type

C = commercial

Digit 3 - Condenser Medium

I = integral air-cooled

Digit 4 - Development Sequence

J = development series

Digit 5, 6, 7- Unit Nominal Capacity

050 = 5 tons
075 = 7.5 tons
100 = 10 tons
150 = 15 tons

Digit 8 - Unit Voltage

3 = 208 - 230 volt/60 hz/3 ph
4 = 460 volt/60 hz/3 ph
5 = 575 volt/60 hz/3 ph

Digit 9 - Air Flow Configuration

1 = horizontal discharge/rear return
2 = vertical discharge/front return
3 = vertical discharge/rear return

Digit 10, 11 - Design Sequence

**= factory assigned

Digit 12 - Air Filter Type

1 = one-inch fiberglass throwaway

Digit 13 - Control

0 = control interface

Digit 14 - Unit Finish

1 = painted

Digit 15 - Coil Finish

0 = none
C = condenser coated
E = evaporator coated
H = condenser + evaporator coated

General Information

The integral air-cooled unit, model SCIJ with Micro-Channel Condenser, is a high efficiency, vertical air cooled air conditioner. Units have either front or top discharge configuration options and easy service access. Unit construction is heavy gage steel with a baked enamel finish. Available unit voltages are 208/3/60, 230/3/60, and 460/3/60, 575/3/60.

Commonly Used Acronyms

For convenience, a number of acronyms and abbreviations are used throughout this manual. These acronyms are alphabetically listed and defined below.

cfm = cubic-feet-per-minute

CKT = circuit

CV = constant volume

CW = clockwise

CCW = counterclockwise

E/A = exhaust air

F/A = fresh air

IOM= installation/operation/maintenance manual

LH = left-hand

O/A = outside air

psig = pounds-per-square-inch, gauge pressure

R/A = return air

RH = right-hand

RPM = revolutions-per-minute

S/A = supply air

SZ = single-zone (unit airflow)

VAV = variable air volume

Note: *Cross-reference to related publication: Internal Air-Cooled Self-Contained Product Catalog: PKG-PRC019-EN.*

Refrigeration Circuits

Units are configured in single or double refrigeration circuits. Each circuit consists of a:

- high efficiency scroll compressor mounted on rubber isolation grommets
- condenser and evaporator coils, designed for optimum performance and efficiency with lanced fins and rifled tubing
- filter-drier

Evaporator Section

The evaporator fan section consists of one, two or three forward curved centrifugal fans powered by a premium efficiency motor through an adjustable motor sheave, and fixed diameter blower pulley. The condenser fan section consists of one, two or three forward curved centrifugal fans powered by a premium efficiency motor through an adjustable motor sheave and fixed diameter blower pulley. Condenser motor belt tension is adjusted by an adjustable motor mounting base. Control box access is from the front of the unit to ease electrical hook-up.

Controls

The standard control panel consists of a high voltage terminal block, overload relays for each fan motor, transformer, 3-pole 24 volt contactors for each motor and compressor, and a 5-second delay timer. Remote thermostat controls are field-installed.

Field Installed Accessories

These items ship separately for field installation:

- steam coil
- hot water coil
- plenum
- low ambient kit
- oversized or s-speed motors
- remote thermostat

Note: *Application of the above options and/or accessories may require field adjustment of fan speeds to ensure proper airflow and performance.*

Installation

Pre-Installation Considerations

Checklist

The following checklist gives an overview of the recommended pre-installation considerations. Follow the procedures in this section to ensure installation is complete and adequate for proper unit operation. Verify this checklist is complete before beginning unit installation.

- Verify the unit size and tagging with the unit nameplate to ensure the correct unit is received.
- Inspect the unit for possible shipping damage and make any necessary claims with the freight delivery company immediately.
- Before installing the unit, remember to allow minimum recommended clearances for routine maintenance and service. Refer to unit dimensions and clearances on submittals or in the "Dimensions and Weights," p. 8section.
- Verify the unit is configured properly prior to beginning unit installation.
- Make proper acoustic considerations before installing unit. Do not install unit near sound-sensitive locations.
- Allow adequate space for service and operating clearances. Reference "Service Access," p. 7 section on this page.
- Make provisions for correct supply power and note electrical connection knockouts locations on the unit submittals or in the "Dimensions and Weights," p. 8 section.
- Ensure the unit installation location is level.

Receiving and Handling

Shipping Package

Integral air-cooled units ship assembled on skids. Units ship in the unitary configuration, assembled, piped, and charged with refrigerant.

Receiving Checklist

Complete the following checklist immediately after receiving unit shipment to detect possible shipping damage.

- Verify that the unit nameplate data corresponds to the sales order and bill of lading (including electrical data).
- Visually inspect the unit exterior for physical signs of shipping damage or material shortages.
- If a unit appears damaged, inspect it immediately before accepting the shipment. Remove access panels and check for interior component damage. Make specific notations concerning the damage on the freight bill. Do not refuse delivery.
- Report concealed damage to the freight line within the allotted time after delivery. Verify with the carrier their allotted time to submit a claim.

Note: *Failure to follow these procedures may result in no reimbursement for damages from the freight company.*

- Do not move damaged material from the receiving location. It is the receiver's responsibility to provide reasonable evidence that concealed damage did not occur after delivery.
- Do not continue unpacking the shipment if it appears damaged. Retain all packaging. Take photos of damaged material if possible.
- Notify the carrier's terminal of the damage immediately by phone and mail. Request an immediate joint inspection of the damage by the carrier and consignee.
- Notify your Trane representative of the damage and arrange for repair. Have the carrier inspect the damage before making any repairs to the unit.

Unit Storage

Take precautions to prevent condensate from forming inside the unit's electrical compartments and motors if the unit is stored before it is installed.

Service Access

Maintain adequate clearances around and above the unit to ensure proper unit operation and allow sufficient service access. Trane recommends 36-inches service access on all sides of the unit.

⚠ WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Acoustic Considerations

Before determining the final unit installation site, remember that proper unit placement is critical in reducing transmitting sound levels to the building. The ideal time to make provisions to reduce sound transmissions is during the design phase. The most economical means of avoiding a potential acoustical problem is to place units in areas that are not acoustically sensitive.

Unit Location

Install the unit in a dry, indoor area between 50 and 115°F. Choose a location where sound levels, airflow and vibration, commonly associated with heavy-duty commercial equipment, will not be objectionable to occupants. In multiple unit installations, separate the individual units and stagger their location from floor to floor so as not to starve units for air and not to discharge warm condenser air from one condenser into the intake of another condenser. Place thermostats, air supplies and returns so that the individual unit will operate within its zone.

Installation Preparation

Before installing the unit, perform the following procedures to ensure proper unit operation.

1. Verify the installation location is level. To ensure proper unit operation, install the unit level (zero tolerance) in both horizontal axes. Failure to level the unit properly can result in condensate management problems, such as standing water inside the unit. Standing water and wet surfaces inside units can result in microbial growth (mold) in the drain pan that may cause unpleasant odors and serious health-related indoor air quality problem.
2. Allow adequate service and code clearances as recommended in the "Service Access," p. 7 section.
3. Position the unit in its final location.

Unit Placement

Install the unit on a firm, level surface.

Installing Optional Accessories

Before installing ductwork, install accessories on unit.

Dimensions and Weights

Table 1. Unit dimensions (with Micro-channel condenser coil), in-lbs.

Unit Size (tons)	A	B	C	D	E	Weights	
						Ship	Operating
5	56.69	20.63	20.63	18.92	18.92	945	856
7.5	—	—	—	—	—	1342	1210
10	—	—	—	—	—	1474	1342
15	—	—	—	—	—	2077	1923

Note: 7.5-ton and 10-ton in Figure 2, p. 9, 15-ton in Figure 3, p. 9

Figure 1. 5-ton unit

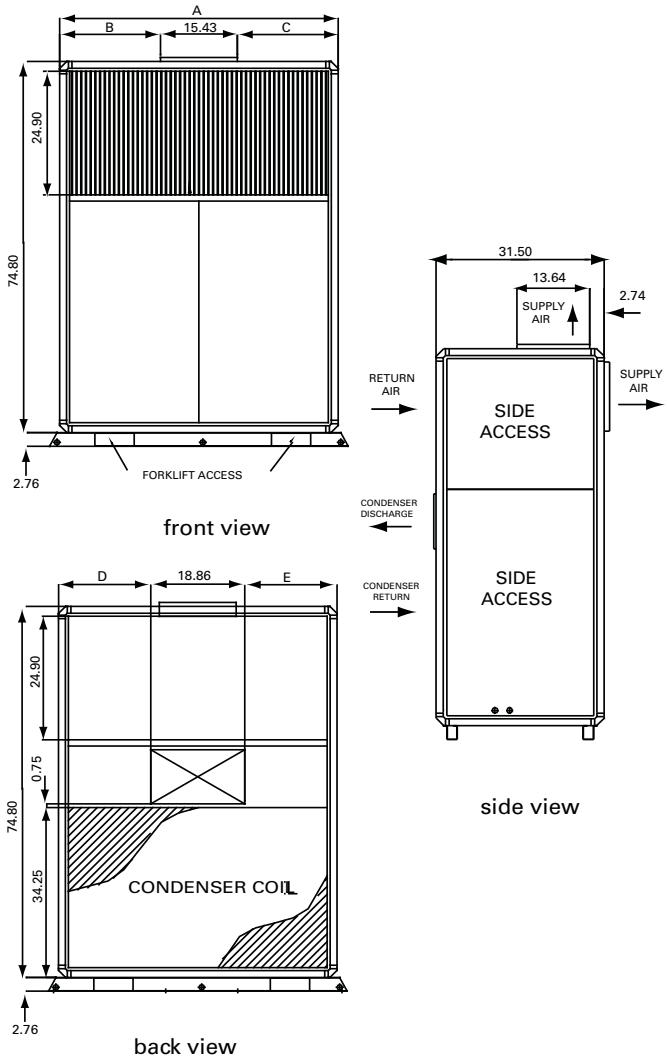
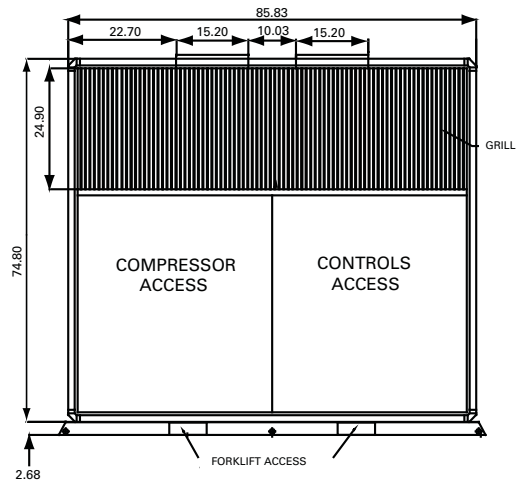
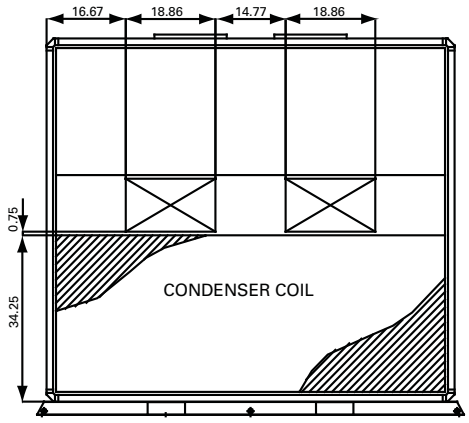


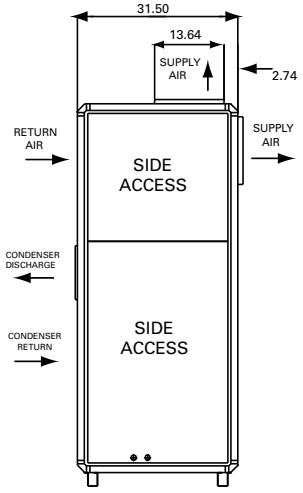
Figure 2. 7.5 and 10-ton unit



front view

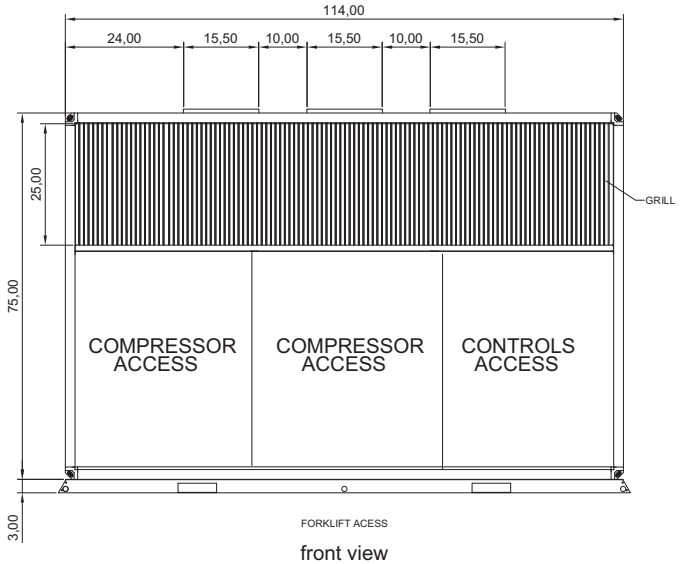


back view

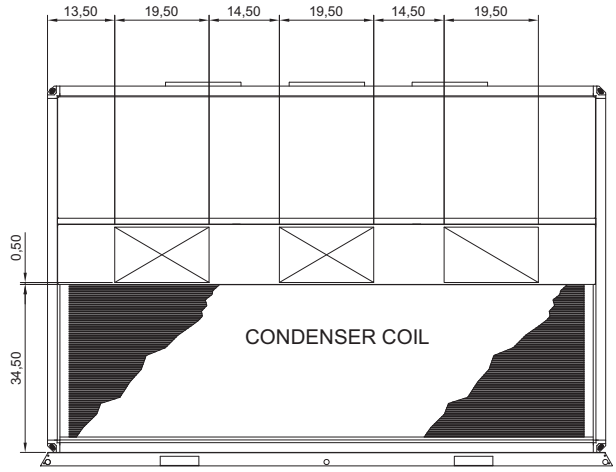


side view

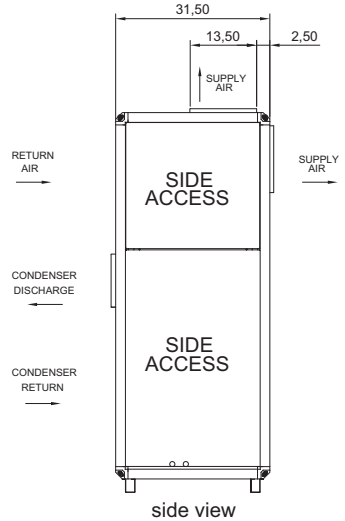
Figure 3. 15-ton unit



front view



back view



side view

Figure 4. Component overview

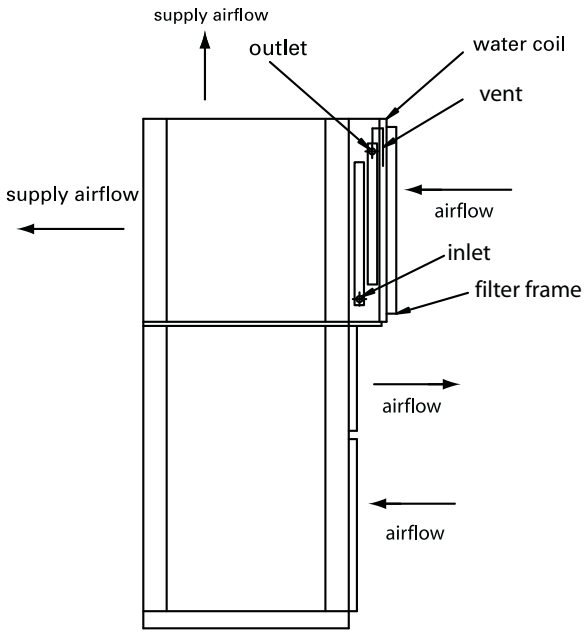


Figure 5. Plenum

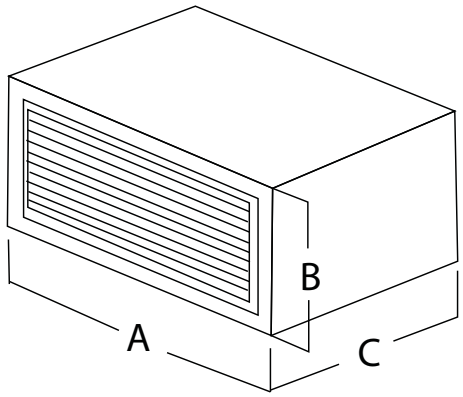


Table 2. Plenum dimensions & weight, in-lbs.

Unit Size (tons)	A	B	C	Grill Size (W x H)	Weight
5	56 ¾	16 ¼	31 ½	52 ¾ x 12 ¾	95
7.5 & 10	85 7/8	16 ¼	31 ½	81 ¾ x 12 ¾	141
15	114	16 ¼	31 ½	110 x 12 ¾	188

Figure 6. Hot water coil

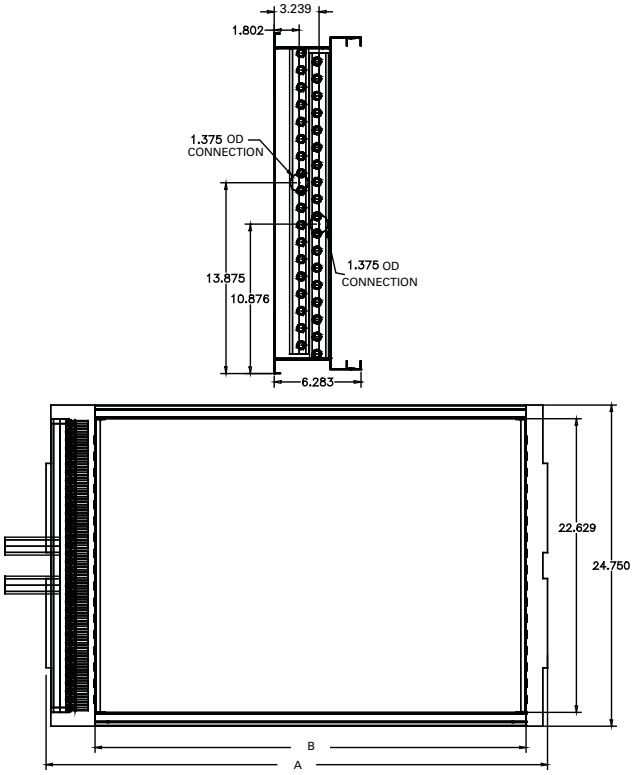


Table 3. Hot water coil dimensions & weight, in-lbs.

Unit Size (tons)	A	B	Weight	
			Wet Coil	Dry Coil
5	52 ½	47 1/16	63	50
7.5 & 10	81 5/	76 ¼	96	75
15	109 ¼	104 ¼	137	108

Notes:
1. Coils are field installed
2. Coil connections are mirror-image and can be mounted with either left or right hand connections.

Figure 7. Steam coil

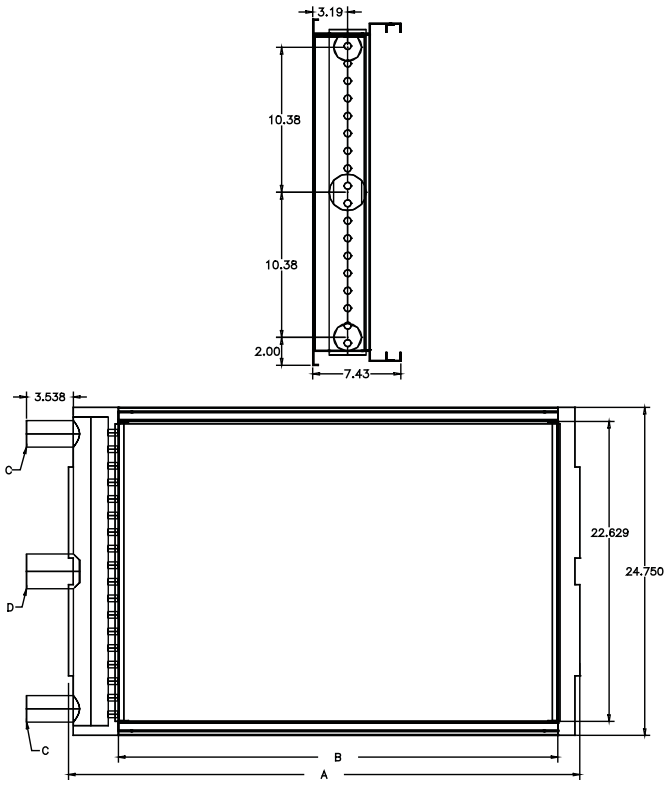


Table 4. Steam coil dimensions & weights, in-lbs.

Unit Size (tons)	A	B	Return C	Supply D	Weight
5	52 ½	45 7/8	1 ½	2	68
7.5 & 10	81 5/8	74	2	3	93
15	109 ¾	102 1/8	2	3	132

Note: Coils are field-installed.
Note: Coil Connections are mirror-image and can be mounted with either left or right-hand connections.

Mechanical Requirements

Ductwork Considerations

Install all air ducts according to the National Fire Protection Association standards for the "Installation of Air Conditioning and Ventilation Systems other than Residence Type (NFPA 90A) and Residence Type Warm Air Heating and Air Conditioning Systems (NFPA 90B).

Make duct connections with a flexible material such as heavy canvas. If a fire hazard exists, Trane recommends using Flexweave 1000, type FW30 or equivalent canvas. Use **three inches** for the return duct and **three inches** for the discharge duct. Keep the material loose to absorb unit vibration.

Run the ductwork as far as possible without changing size or direction. Do not make abrupt turns or transitions near the unit due to increased noise and excessive static losses. Use elbows with splitters or turning vanes to minimize static losses.

Poorly constructed turning vanes may cause airflow generated noise. Check total external static pressures against fan characteristics to be sure the required airflow is available throughout the ductwork.

Direct louvers up and down for condensers air discharge and intake so as to not short circuit condenser air. Pitch outdoor ducts away from unit to protect unit from rain and snow entering with condenser air. Auxiliary louvers and hoods may be required for this purpose. Attach ducts to unit with canvas section duct connectors or other suitable noise and vibration absorbing devices.

Electrical Requirements

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

⚠WARNING

Proper Field Wiring and Grounding Required!

All field wiring MUST be performed by qualified personnel. Improperly installed and grounded field wiring poses FIRE and ELECTROCUTION hazards. To avoid these hazards, you MUST follow requirements for field wiring installation and grounding as described in NEC and your local/state electrical codes. Failure to follow code could result in death or serious injury.

Electrical Requirements

Follow these guidelines, referring to unit wiring diagrams and supply power dimensional information to ensure correct electrical requirements at the installation site. Reference supply power wiring locations on unit submittals or in section "Dimensions and Weights," p. 8. Specific unit wiring diagrams are provided on each unit. Use these diagrams for connections or trouble analysis.

Supply Power Wiring

It is the installer's responsibility to provide power supply wiring to the unit. Wiring should conform to NEC and all applicable code requirements. To ensure the unit supply power wiring is properly sized and installed, follow the guidelines below:

1. Verify the power supply available is compatible with the unit nameplate ratings. The supply power must be within 10% of the rated voltage listed on the unit nameplate.
2. Reference the electrical data. Table 5, p. 13 refers to standard motor, and Table 6, p. 13 refers to oversized motor. Protect the electrical service from over current and short circuit conditions in accordance with NEC requirements. Size protection devices according to the electrical date on the unit nameplate.
3. If using a field-supplied disconnect, install it at or near the unit in accordance with NEC. Do not mount a field-supplied disconnect on the unit. Reference the electrical service entrance location on unit submittals.
4. Complete the unit power wiring connections onto either the main terminal block or the field-provided non-fused disconnect switch.
5. Provide proper unit grounding in accordance with local and national codes.

Electrical Data Calculations

RLA = Rated Load Amps

Compressor LRA = Locked Rotor Amps

Fan Motor LRA = Locked Rotor Amps, N.E.C. Table 430 - 151

FLA = Full Load Amps, N.E.C., Table 430 - 150

Voltage utilization range is ±10 percent

Determination of Minimum Circuit Ampacity (MCA)

MCA = 1.25 x largest motor amps (FLA or RLA) + the sum of the remaining motor amps.

Determination of Maximum Fuse Size (MFS)

MFS = 2.25 x largest motor amps (FLA or RLA) + the sum of the remaining motor amps.

If the rating value determined does not equal a standard current rating of over current protective device, use the next lower standard rating for the marked maximum rating.

Voltage Imbalance

⚠WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

Voltage imbalance on three-phase systems can cause motor overheating and premature failure. Maximum allowable imbalance is 2.0%, and the readings used to determine it must be measured at the compressor terminals.

Voltage imbalance is defined as 100 times the sum of the division of the three voltages from the average voltage. If, for example, the three measured voltages are 221, 230, 227, the average would be:

(221+230+227)/3 = 226 volts

The percentage of voltage imbalance is then:

100*(226-221)/226 = 2.2%

In this example, 2.2 percent imbalance of more than 2.0 percent exists, be sure to check the voltage at the unit disconnect and terminal block switch. If an imbalance at the unit disconnect switch does not exceed 2.0 percent, the imbalance is caused by faulty wiring within the unit. Be sure to conduct a thorough inspection of the unit electrical wiring connections to locate the fault, and make any repairs necessary.

Table 5. Integral air-cooled standard electrical data

Unit Size	Voltage	Compressor		Condenser Fan Motor		Evaporator Fan Motor		MCA	MFS
		RLA	LRA	HP	FLA	HP	FLA		
5	208-230/60/3	16.0	110.0	1.0	3.27	1.0	3.27	26.5	40
	460/60/3	7.8	52.0		1.48		1.48	12.7	20
	575/60/3	5.7	38.9		1.18		1.18	9.5	15
7.5	208-230/60/3	25.0	164.0	1.5	4.53	1.0	3.27	39.1	60
	460/60/3	12.8	100.0		2.05		1.48	19.6	30
	575/60/3	9.6	78.0		1.64		1.18	14.8	20
10	208-230/60/3	16.0	110.0	2.0	6.13	1.5	4.53	46.6	60
	460/60/3	7.8	52.0		2.77		2.05	22.3	30
	575/60/3	5.7	38.9		2.22		1.64	16.7	20
15	208-230/60/3	25.0	164.0	3.0	9.18	3.0	9.18	74.6	90
	460/60/3	12.8	100.0		4.15		4.15	37.1	50
	575/60/3	9.6	78.0		3.32		3.32	28.3	35

Notes:
1. Voltage range:nominal voltage: 208-230V, acceptable range: 187 - 253Vnominal voltage: 460V, acceptable range: 414 - 506Vnominal voltage: 575V, acceptable range: 518 - 633V
2. Ampacity is calculated per UL formula: ampacity = (1.25 x compressor RLA) + the sum of the second compressor RLA (is used) and all other motor FLAs
3. Maximum fuse size is calculated per UL formula: MFS = (2.25 x compressor RLA) + the sum of the second compressor RLA (if used) and all other motor FLAs
4. There are two compressors on 10 and 15-ton units and only one RLA & LRA value is shown in table. The data is the same for both compressors.

Table 6. Integral air-cooled oversized and 2-speed electrical data (with Micro-channel condenser coil)

Unit Size	Voltage	Compressor		Condenser Fan Motor		Evaporator Fan Motor			Evaporator 2-Speed Motor			
		RLA	LRA	HP	FLA	HP	FLA	MCA	HP	FLA	MCA	MFS
5	208-230/60/3	16.0	110.0	2.0	6.13	1.5	4.53	30.6				45
	460/60/3	7.8	52.0		2.77		2.05	14.5		N/A		20
	575/60/3	5.7	38.9		2.22		1.64	11.0				15
7.5	208-230/60/3	25.0	164.0	3.0	9.18	1.5	4.53	45.0				70
	460/60/3	12.8	100.0		4.15		2.05	22.2		N/A		30
	575/60/3	9.6	78.0		3.32		1.64	17.0				25
10	208-230/60/3	16.0	110.0	3.0	9.18	3.0	9.18	54.3	3.0	8.92	54.0	70
	460/60/3	7.8	52.0		4.15		4.15	25.8		4.46	26.1	30
	575/60/3	5.7	38.9		3.32		3.32	19.5		3.57	19.7	25
15	208-230/60/3	25.0	164.0	5.0	15.00	5.0	15.00	86.3	5.0	14.9	86.2	110
	460/60/3	12.8	100.0		6.80		6.80	42.4		7.45	43.1	50
	575/60/3	9.6	78.0		5.44		5.44	32.5		5.96	33.0	40

Note: See PKG-SVX17*-EN for Oversized/2-speed motor kit installation instructions.

Installation Checklist

The checklist listed below is a summary of the steps required to successfully install an integral air-cooled unit. This checklist is intended to acquaint the installing personnel with what is required in the installation process. It does not replace the detailed instructions detailed in the applicable sections of this manual.

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

General Unit Requirements

- Install and secure the ductwork to the unit.
- Check unit for shipping damage and material shortage. Refer to the "Receiving Checklist," p. 7.

Electrical Requirements

- Verify that the electrical power supply characteristics comply with the unit nameplate specifications.
- Inspect all control components; tighten any loose connections.
- Connect properly sized and protected power supply wiring to a field supplied/installed disconnect and unit power terminal block, or to the optional unit mounted disconnect switch.
- Properly ground the unit.

Field Installed Control Wiring (Optional)

- Complete the field wiring connections.

Note: *All field installed wiring must comply with NEC and applicable local codes.*

Fan Discharge Conversion Procedure

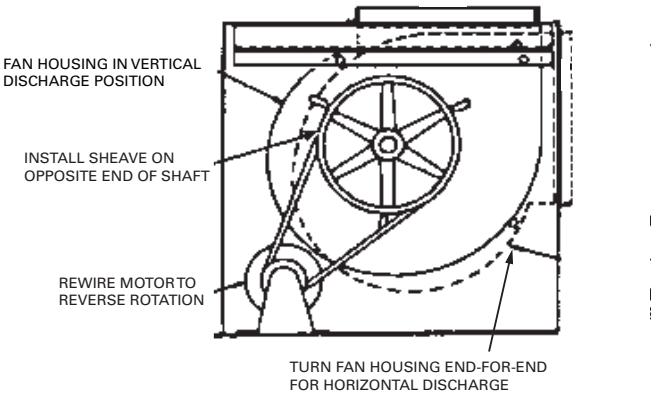
Refer to Figure 8, p. 14 and Table 7, p. 14 while following the steps below to convert the fan discharge from vertical to horizontal.

1. Remove the front and top fan section panels.
2. Loosen the fan motor to release belt tension. Remove the fan belt. Do not force the belt over sheaves.
3. Remove the bolts holding the fan scroll to support channels. Lift fan out through the front of the unit.
4. Move the fan sheave to the opposite end of the fan shaft.
5. Turn the fan scroll end-for-end and bolt it to the support channels with the discharge towards the back. Mounting holes are provided in the fan scroll.
6. Align the fan and motor sheaves. Install the belt and adjust the belt tension. Refer to Table 7, p. 14 for the correct belt size. The belt should depress about one inch under light pressure when properly adjusted.
7. Reverse direction of the motor rotation by exchanging any two of the three motor wire connections.
8. Exchange the front and top panel locations.

Table 7. Belt sizes for fan discharge conversion

Model	Horizontal Discharge	Vertical
SCIJ050	A-34	A-42
SCIH075	A-38	A-45
SCIH100	B-38	B-45
SCIH150	B-34	B-40

Figure 8. Converting fan to horizontal discharge


FAN HOUSING IN VERTICAL DISCHARGE POSITION
INSTALL SHEAVE ON OPPOSITE END OF SHAFT
REWIRE MOTOR TO REVERSE ROTATION
TURN FAN HOUSING END-FOR-END FOR HORIZONTAL DISCHARGE

Low Ambient Control Kit Installation

Reference Figure 9, p. 15 and Figure 10, p. 15 and follow the procedures outlined in Low Ambient Control Kit Installers Guide ACC-SVN134A-EN.

Figure 9. Low ambient kit SCIJ050-075

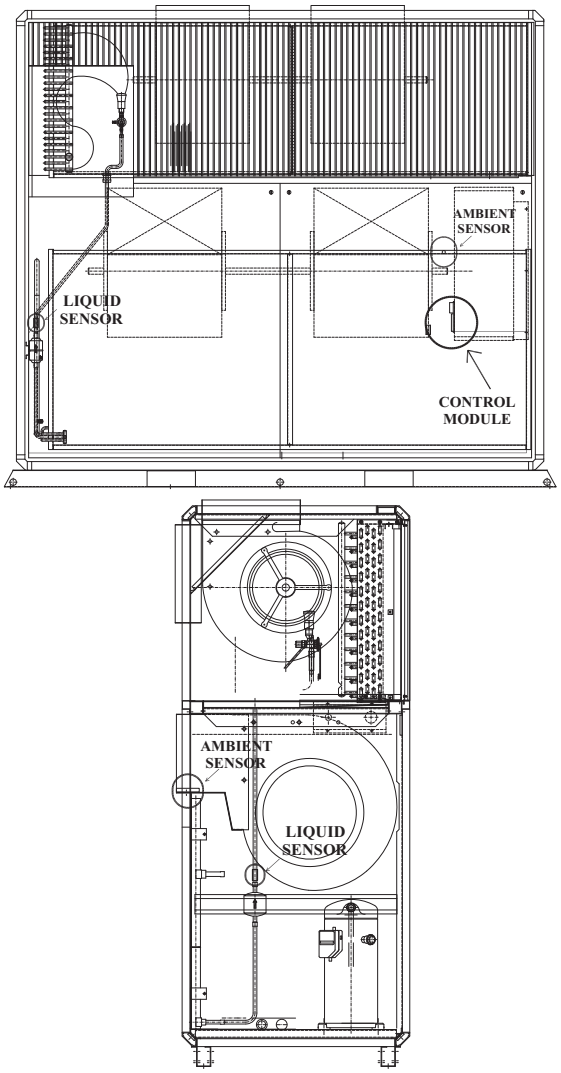
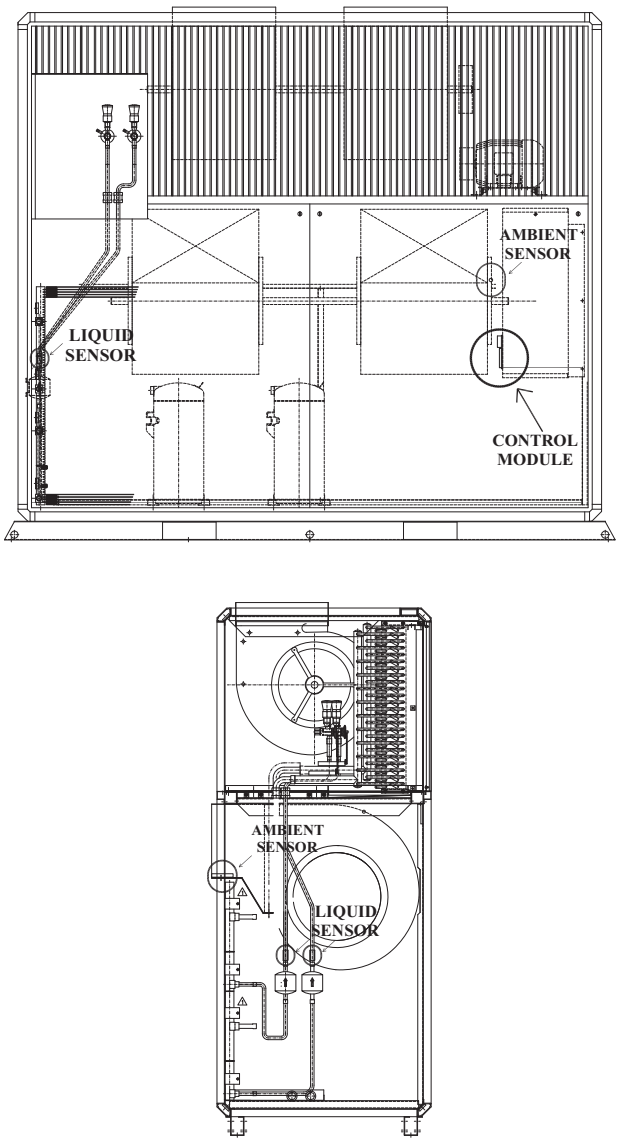


Figure 10. Low ambient kit SCIJ100-150

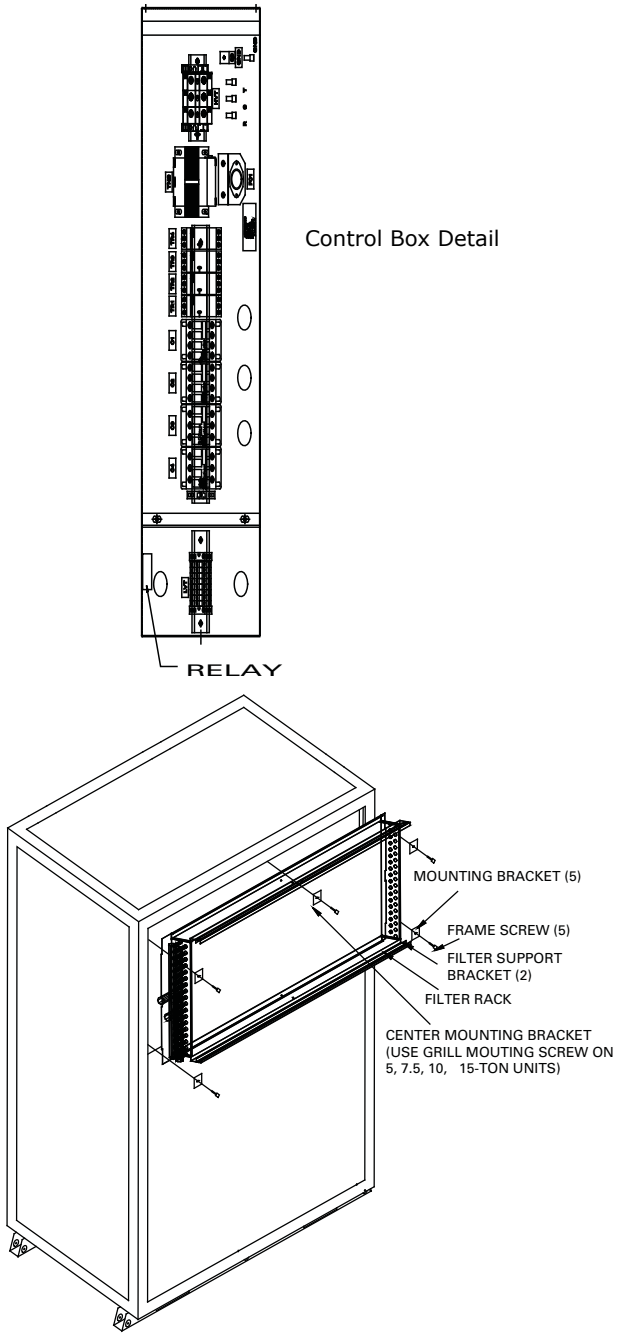


Hydronic Coil Installation

Reference Figure 11, p. 16 and follow the procedure below to install the hydronic coil.

1. Remove the front grill, filters, two upper frame screws, and two lower frame screws.
2. Install the hydronic coil in the space previously occupied by the grill.
3. Use the frame screws and one of the grill screws to clamp the coil end supports between the unit frame and the mounting brackets (supplied with the coil).
4. Slide the filters in the filter rack from either end of the coil.
5. Adjust the filter rack for 2-inch filters by removing the upper and lower filter support brackets.
6. The hydronic coil can be installed for either right or left-hand connections. However, steam coils must have the condensate lines connected to the bottom outlet, with the top outlet capped.
7. A heating coil control relay is factory provided to use with BAY28X182 and BAY28X183 thermostats. Drill two 5/32" holes 7/16" apart and mount the relay in the unit control box as shown in the detail drawing below. Use a 6-32X.31 screw (not included) to mount the relay. Connect wiring in accordance with the thermostat wiring diagram.

Figure 11. Hydronic coil installation

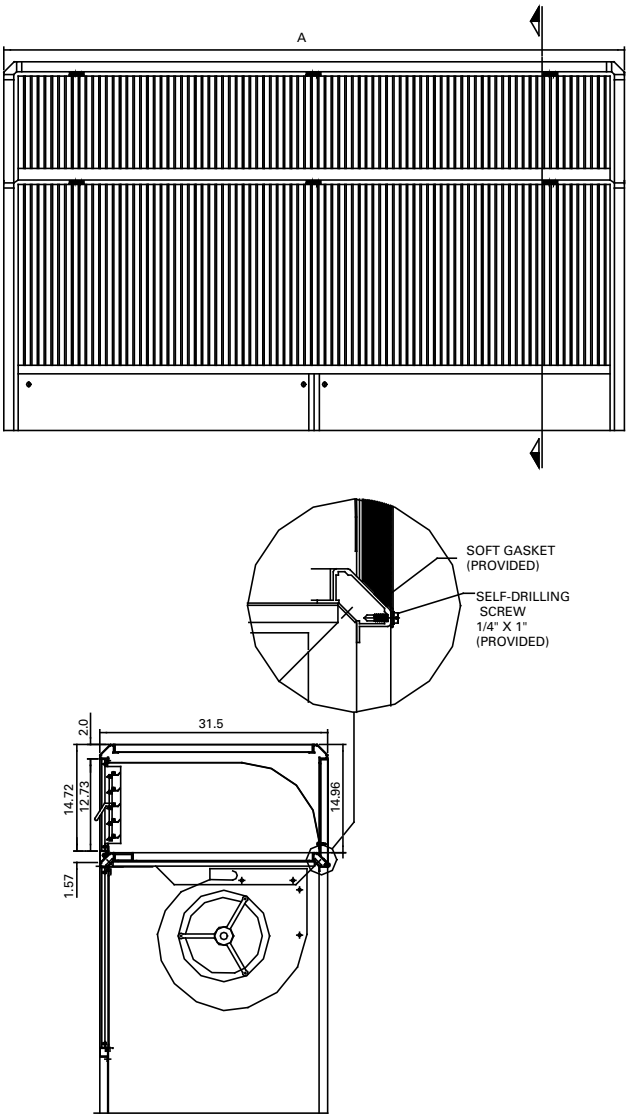

Control Box Detail
RELAY
MOUNTING BRACKET (5)
FRAME SCREW (5)
FILTER SUPPORT BRACKET (2)
FILTER RACK
CENTER MOUNTING BRACKET (USE GRILL MOUTING SCREW ON 5, 7.5, 10, 15-TON UNITS)

Plenum Installation

Reference Figure 12, p. 16 and follow the procedure below to install the plenum.

1. Before installing the plenum, ensure the evaporator fan is in the vertical discharge position. If not, see the "Fan Discharge Conversion Procedure," p. 14.
2. Apply the soft gasket material provided completely around the top of the unit frame as shown in the detail drawing.
3. Tighten the screws provided as shown. Use screws on the rear, right, and left sides through the pilot holes on the plenum panels.
4. After the plenum is installed, adjust the motor pulley for the correct airflow and discharge grille for the correct airflow direction.

Figure 12. Plenum installation



Pre-Startup Checklist

Complete this checklist after installing the unit to verify all recommended installation procedures are complete before unit startup. This does not replace the detailed instructions in the appropriate sections of this manual. Always read the entire section carefully to become familiar with the procedures.

⚠ WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Receiving

- Inspect unit and components for shipping damage. File damage claims immediately with the delivering carrier.
- Check nameplate unit data so that it matches the sales order requirements.
- Check unit for missing material. Look for ship-with accessories that are packaged separately and placed inside the access panel, fan section, or compressor section. See the "Receiving and Handling," p. 7 section.

Unit Location

Ensure the unit location is adequate for unit dimensions, ductwork, piping, and electrical connections.

Ensure access and maintenance clearances around the unit are adequate. See the "Service Access," p. 7 section.

Unit Mounting

Remove shipping brackets on the compressor assembly and supply fan.

Component Overview

Verify the fan and motor sheaves are aligned.

Check the belt tension for proper adjustment.

Ensure the fan rotates freely.

Tighten locking screws, bearing set screws and sheaves.

Ensure bearing locking collars do not wobble when rotated.

Ensure all air filters are properly installed with consideration of size and air flow.

Manually rotate the condenser and evaporator fans to ensure free movement. Verify that all of the fan mounting hardware is tight.

Ductwork

Verify that all ductwork conforms to NFPA 90A or 90B and all applicable local codes.

Unit Startup Procedures

⚠ WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

1. Check all electrical connections for tightness.
2. Be sure all unit accessories are properly set and installed.
3. Inspect all ductwork and duct connections.
4. Check for proper belt tension.
5. Check fan drive sheaves, pulleys, and bearings.

Unit Startup Checklist

1. Set thermostat to Off position
2. Engage power supply by closing power disconnect
3. Switch thermostat to fan position and adjust temperature setting below room temperature. Evaporator fan should start.
4. Check evaporator section for proper operation
5. Switch thermostat to cool position and adjust temperature setting to below room temperature. The evaporator fan, condenser fan(s), and compressor(s) should start.

Note: *These units are equipped with high efficiency scroll compressors. Check for proper scroll rotation prior to operating this unit.*

⚠ WARNING

Rotating Components!

During installation, testing, servicing and troubleshooting of this product it may be necessary to work with live and exposed rotating components. Have a qualified or licensed service individual who has been properly trained in handling exposed rotating components, perform these tasks. Failure to follow all safety precautions could result in rotating components cutting and slashing technician which could result in death or serious injury.

6. Check condenser fan for proper rotation. If fan rotation is incorrect, switch thermostat to Off position and disconnect power. Reverse two phase leads at disconnect and return back to Step 1 of startup.
7. Allow unit to run until all system temperatures and pressures stabilize.
8. Check systems for proper operation and performance. Observe unit in operation and check for unusual noise, vibration, belt and fan clearances.

Operation

Sequence of Operation

The thermostat controls the unit operation. It has both manual and automatic switches so the thermostat maintains desired comfort levels.

The fan switch allows manual selection of the fan speed using the On or Auto setting. With the switch set in the On position, the evaporator fan runs continuously, independent from the thermostat temperature setting. The Auto position cycles the evaporator fan on and off with the demand for heating or cooling.

The system switch may have two or more positions. For example, using a cooling only thermostat, the system switch can be set in the Off or the Cool position. The Off position disconnects power from the thermostat contacts that control the condensing unit. This prevents the condensing unit from running, regardless of the thermostat temperature setting. The evaporator fan may circulate air if the fan switch is in the On position. With the switch in the Cool position the condensing unit and evaporator will operate on a signal from the thermostat calling for cooling.

With the fan switch set to Auto and the system switch set to Cool, the following sequence takes place. On a rise in room temperature, the thermostat contacts close to provide power to the evaporator fan contactor, the condensing unit fan contactor, and the condensing unit compressor contactors. As the room temperature reaches setpoint, the thermostat contacts open to de-energize all contactors, and the system cycles off. This system will remain off until additional cooling is required and the cycle repeats.

Table 8. Normal operating conditions

high pressure	320 to 570 psig
low pressure	100 to 160 psig
superheat	7 to 16°F
subcooling	9 to 18°F
liquid sightglass	refrigeration flow with no gas traces
current	must not surpass the rated current

Table 9. Controls adjustment

Control	Disarming	Rearming
High pressure control	650 ± 10 psig	550 ± 10 psig
Low pressure control	51 ± 7 psig	94 ± 7 psig
Motor windings thermostat	221 ± 5°F	180 ± 5°F

Maintenance

Table 10. Integral air cooled general data (with Micro channel condenser coil)

Nominal Tons	5	7.5	10	15
ARI capacity - btu/h	60500	89000	117000	170000
System Power - kW Data	5.41	7.68	10.40	15.50
(S)EER/IEER	13.00	11.20/11.40	11.20/11.40	11.00/11.20
R-410A charge/circuit (lbs.)	6.94	8.75	4.75 / 4.88	8.50 / 8.50
Shipping weight-lbs.	945	1342	1474	2077
Operating weight-lbs.	856	1210	1342	1923
Compressor, qty-hp	1	1	2	2
Circuits	1	1	2	2
Condenser - Micro channel				
Face area, sq/ft.	11.35	16.58	16.58	24.05
Rows / fpf	1 / 276	1 / 276	1 / 276	1 / 276
Fans, qty.	1	2	2	3
Fan size, in.	15 x 15	15 x 15	15 x 15	15 x 15
Motorhp	1.0	1.5	2.0	3.0
Evaporator				
Face area, sq/ft.	8.37	12.89	12.89	17.60
Rows / fpf	4 / 168	3 / 144	3 / 144	4 / 144
Filter qty. - size, in.	2 - 23.7 x 25	3 - 23.7 x 25.6	3 - 23.7 x 25.6	3 - 23.7 x 18 + 2 - 23.7 x 25.6
Fans qty. - size, in	1 - 12 x 12	2 - 12 x 12	2 - 12 x 12	3 - 12 x 9
Motorhp	1.0	1.0	1.5	3.0
Min. airflow	1800	2700	3600	5400
Rated airflow Data	2000	3000	4000	6000
Max. airflow	2200	3300	4400	6600

Notes:
1. Net cooling capacity is rated at 95°F ambient, 80°F entering dry bulb and 67°F entering wet bulb at scfm air condition. 2. EER is rated at ARI conditions.
2. SEER applies to 5 ton unit - ARI 210-240 Certified - pre June 16, 2008.

Maintenance Procedures

Before beginning any maintenance procedures heed all warnings and cautions.

⚠WARNING
Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Periodic Maintenance Checklist

- Inspect coil surface for cleanliness. Clean as required. Refer to "Coil Cleaning Procedure," p. 20 under "Maintenance Procedures," p. 19.

Annual Maintenance Checklist

- Perform all monthly maintenance inspections.
- Perform seasonal startup checks.
- Leak test refrigerant circuits. Inspect contacts of fan motor contactors and relays. Replace all worn contacts.
- Clean condenser fans.
- Clean and repaint any corroded surface.

Periodic Maintenance Procedures

This section describes specific maintenance procedures that must be preformed as a part of the normal maintenance program for this unit. Be certain to disconnect electrical power to the unit before performing these procedures.

Note: *The following coil cleaning procedures apply only to the outdoor condensers. Do not use these procedures for the reheat or evaporator coils.*

Cleaning the Condenser Coils

⚠WARNING

Hazardous Chemicals!

Coil cleaning agents can be either acidic or highly alkaline and can burn severely if contact with skin occurs. Handle chemical carefully and avoid contact with skin. ALWAYS wear Personal Protective Equipment (PPE) including goggles or face shield, chemical resistant gloves, boots, apron or suit as required. For personal safety refer to the cleaning agent manufacturer's Materials Safety Data Sheet and follow all recommended safe handling practices. Failure to follow all safety instructions could result in death or serious injury.

Clean the coil at least once each year or more frequently if located in a dirty environment, to help maintain proper unit operating efficiency. High discharge pressures are a good indication that the coil needs cleaning.

To clean the refrigerant coil, use a soft brush and sprayer, such as a garden pump up or high pressure type. Water is all that should be used for cleaning coil. Detergent use is not recommended.

Coil Cleaning Procedure

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

1. Disconnect power to the unit.
2. Remove panels from the unit to gain access to the coil.
3. Use a soft brush to remove loose dirt and debris form both sides of the coil.
4. Straighten coil fins with fin comb as required.
5. Use Water only to rinse coil. Be sure to follow these guidelines if using a high-pressure sprayer:
   a. Minimum nozzle spray angle is 15°.
   b. Spray solution at a 90° angle to the coil face.
   c. Keep sprayer nozzle at least six inches form the coil.
   d. Sprayer pressure must not exceed 600 psi.
6. Spray leaving air side of the coil first then spray the entering air side of the coil. Allow the detergent and water solution to stand on the coil for five minutes.
7. Rinse both sides of the coil with cool, clean water.
8. Inspect the coil. If it still appears dirty, repeat the cleaning procedure.
9. Reinstall all unit components and panels, and restore electrical power and gas supply to the unit.

Refrigerant System

Follow the Trane recommended procedures on operation, maintenance, and service to ensure refrigerant conservation and emission reduction. Also, pay specific attention to the following:

- Whenever removing refrigerant from air conditioning or refrigerating equipment, recover for reuse, recycle, reprocess (reclaim), or properly destroy it.
- Always determine possible refrigerant recycling or reclaiming requirements before beginning recovery. Questions about recovered refrigerants and acceptable refrigerant quality standards are addressed in ARI Standard 700.
- Use approved containment vessels and safety standards. Comply with all applicable transportation standards when shipping refrigerant containers.
- To minimize emissions while recovering refrigerant, use recycling equipment. Always attempt to use methods which will pull the lowest possible system vacuum while recovering and condensing refrigerant into containment.
- When leak checking, be aware of any new leak test methods which eliminate refrigerant as a trace gas.
- When cleaning system components or parts, do not use CFC11 (R11) or CFC113 (R113). Refrigeration system clean up methods using filters and dryers are recommended. Do not use solvents which have ozone depletion factors. Properly dispose of used materials.
- Take extra care to properly maintain all service equipment directly supporting refrigerant service work such as gauges, hoses, vacuum pumps, and recycling equipment.
- Stay aware of unit enhancements, conversion refrigerants, compatible parts, and manufacturer's recommendations that will reduce refrigerant emissions and increase equipment operating efficiencies. Follow specific manufacturer's guidelines for conversion of existing systems.
- To assist in reducing power generation emissions, always attempt to improve equipment performance with improved maintenance and operations that will help conserve energy resources.

Refrigerant Leak Testing

⚠WARNING

Confined Space Hazards!

Do not work in confined spaces where refrigerant or other hazardous, toxic or flammable gas may be leaking. Refrigerant or other gases could displace available oxygen to breathe, causing possible asphyxiation or other serious health risks. Some gases may be flammable and or explosive. If a leak in such spaces is detected, evacuate the area immediately and contact the proper rescue or response authority. Failure to take appropriate precautions or to react properly to such potential hazards could result in death or serious injury.

⚠WARNING

Hazard of Explosion!

Use only dry nitrogen with a pressure regulator for pressurizing unit. Do not use acetylene, oxygen or compressed air or mixtures containing them for pressure testing. Do not use mixtures of a hydrogen containing refrigerant and air above atmospheric pressure for pressure testing as they may become flammable and could result in an explosion. Refrigerant, when used as a trace gas should only be mixed with dry nitrogen for pressurizing units. Failure to follow these recommendations could result in death or serious injury or equipment or property-only damage.

In the event of required system repair, leak test the liquid line, evaporator coil, and suction line at pressures dictated by local codes, and using the following guidelines.

1. Charge enough refrigerant and dry nitrogen into the system to raise the pressure to 100 psig.
2. Use a halogen leak detector, halide torch, or soap bubbles to check for leaks. Check interconnecting piping joints, the evaporator coil connections, and all accessory connections.
3. If a leak is detected, release the test pressure, break the connections and reassemble it as a new joint, using proper brazing techniques.
4. If no leak is detected, use nitrogen to increase the test pressure to 150 psig and repeat the leak test. Also, use soap bubbles to check for leaks when nitrogen is added.
5. Retest the system to make sure new connections are solid.
6. If a leak is suspected after the system has been fully charged with refrigerant, use a halogen leak detector, halide torch, or soap bubbles to check for leaks.

Refrigerant Evacuation

For field evacuation, use a rotary style vacuum pump capable of pulling a vacuum of 100 microns or less.

When connecting the vacuum pump to a refrigeration system, it is important to manifold the pump to both the high and low side of the system. Follow the pump manufacturer's directions.

⚠WARNING

Hazardous Pressures!

If a heat source is required to raise the tank pressure during removal of refrigerant from cylinders, use only warm water or heat blankets to raise the tank temperature. Do not exceed a temperature of 150°F. Do not, under any circumstances apply direct flame to any portion of the cylinder. Failure to follow these safety precautions could result in a sudden rise of pressure possibly resulting in a violent explosion which could result in death or serious injury.

NOTICE:

Compressor Damage!

Do not use a Meg ohm meter or apply power to the winding of a compressor while it is under a deep vacuum. This may damage the motor windings.

Charging the Refrigerant System

NOTICE:

Compressor Damage!

Do not allow liquid refrigerant to enter the suction line. Excessive liquid accumulation in the liquid lines could result in compressor damage.

NOTICE:

Compressor Damage!

Never manually or automatically pump down system below 7 psig. This will cause the compressor to operate in a vacuum and result in compressor damage.

To completely charge the system, charge gaseous refrigerant into the suction line shrader valve with the unit running. However, make sure that some refrigerant is present in each circuit before starting the compressors.

Periodic Checklists

Monthly Checklist

The following checklist provides the recommended maintenance schedule to keep the unit running efficiently.

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

⚠WARNING

Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

1. Inspect unit air filters. Clean or replace if airflow is blocked or if filters are dirty.
2. Inspect coils for icing. Icing on the coils may indicate low airflow supply, restricted airflow from dirty fins.
3. Check the fan belt condition and tension. Adjust tension if belt is floppy or squeals continually.
4. Check and record operating pressures.

Semi-Annual Maintenance

1. Verify the fan motor is properly aligned and bolted tight to the motor frame.
2. Lubricate fan bearings.
3. With power disconnected, manually rotate the fan wheel to check for obstructions in the housing or interference with fan blades. Remove obstructions and debris. Center the fan wheel if necessary.
4. Check the fan assembly sheave alignment. Tighten set screws to their proper torques.

Note: *Perform this procedure monthly if the unit is in a coastal or corrosive environment.*

Annual Maintenance

Check and tighten all set screws, bolts, locking collars and sheaves.

1. Inspect, clean, and tighten all electrical connections.
2. Visually inspect the entire unit casing for chips or corrosion. Remove rust or corrosion and repaint surfaces.
3. Visually check for leaks in refrigerant piping.
4. Inspect fan, motor, and control contacts. Replace badly worn or eroded contacts.
5. Inspect the thermal expansion valve sensing bulbs for cleanliness, good contact with the suction line, and adequate insulation from ambient air.

Troubleshooting

Use the following steps and procedures to help correct these common problems.

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Problem	**Remedy**
The entire unit does not operate.	
Possible cause	
1. Power interruption	1. Check for blown fuses or tripped circuit breakers. Replace or reset if necessary.
2. Thermostat not operating	3. Setting may be too high; check unit and reset. Thermostat may be out of calibration or otherwise defective; replace.
4. Electrical panel a. 24-volt transformer defective b. loose wire	5. Correct as required.

Problem	**Remedy**
Fan runs but compressor does not start.	
Possible cause	
1. Low voltage	1. Check power supply for voltage outside the acceptable voltage range.
2. Remote thermostat	3. Check the control unit for loose wires. Firm any loose connections.
4. Compressor contactor open or burned	5. Replace.
6. High pressure control cutting out unit	7. Check for loose wire connection, broken or burned contacts. If defective, replace.
8. Refrigerant leak - no gas	9. Locate leak and repair. Recharge unit.
10. Loose or defective wires.	11. Tug on wires to see if they will separate from connections. Replace terminals if necessary.
12. Compressor shorted, open or burned	13. Check for shorts, opens, and grounded. Remove and replace compressor.
14. Defective compressor	15. Remove and replace.

Problem	Remedy
Unit held off by safety.	
Possible cause	
1. Unit cutout on high pressure control, set at 650 psig for SCIJ	1. Verify the airflow is uninterrupted. Also, verify that the low ambient control is set properly, allowing condensing temperatures of 90–135°F. Reset high pressure switch to start.
2. Refrigerant leak	3. See if unit is low on refrigerant charge. Repair leak and recharge unit.
4. Air restriction, dirty coils	5. Verify if the air filter is dirty or has an airflow restriction, and correct problem.
6. Partial restriction in refrigerant system	7. Locate restriction by inspecting refrigerant lines for temperature changes. Remove restriction, evacuate, and recharge.
8. High pressure control	9. Replace, if defective.
10. TXV power element charge loss	11. Evacuate, replace element, recharge.
12. Loose connection in electrical unit	13. Trace and firm up connection.

Problem	Remedy
Noisy operation.	
Possible cause	
1. Copper tubing vibrating	1. Adjust tubes by bending slightly to firm position without touching other unit parts.
2. Machine vibrating out of level	3. Level unit base. Fully support base.
4. Loose cabinet or internal component	5. Check and tighten loose screws.
6. Loose fan wheel	7. Tighten screws on fan wheel shaft.
8. Blower wheel hitting shroud	9. Adjust wheel position on motor shaft
10. Blower motor bearing defective	11. Replace fan motor.
12. Blower bearing defective	13. Replace fan bearing.

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Problem	Remedy
Insufficient cooling	
Possible cause	
1. Insufficient air flow due to: • dirty evaporator • ice on evaporator coils (indicates airflow restriction through evaporator) • dirty filter • obstructed discharge air intake • fan motor not running • evaporator fan or fan wheel slipping on motor shaft	1. Correct as follows: • clean • defrost (using fan operation only) • clean or replace filter • remove obstruction • check electrical system • adjust fan position, tighten set screw on fan wheel
2. Heat gain or loss in room exceeds unit capacity	3. Refer to original load calculations. Recalculate heat gain or loss.
4. Defective compressor	5. Replace, if necessary.
6. Insufficient refrigerant charge indicated by • low wattage • condenser air outlet cold	7. Check refrigerant charge pressure with gauges. If refrigerant is low, recharge system.
8. Overcharge of refrigerant indicated by high wattage and sweating of the compressor return line	9. Reclaim excess refrigerant.
10. Thermostat not set for full cooling	11. Refer to thermostat operating instructions.
12. Insufficient airflow through condenser due to: • dirty condenser • loose belt • fan loose on shaft	13. Correct as follows: • clean coil • verify drive is adjusted correctly • tighten fan on shaft
14. Cutout on high pressure	15. See that air is flowing and that low ambient control is set properly.
16. Only one refrigerant circuit operational in 2-circuit units	17. Reset high pressure cutout on inoperative circuit. Check contactor in inoperative circuit.

Problem	Remedy
Unit short cycles	
Possible cause	
1. Remote thermostat	1. Repair or replace
2. Loose connection in electrical unit	3. Trace and repair
4. Thermostat contacts fluttering	5. Repair or replace
6. Air flow to evaporator is restricted	7. Flush or blow dirt out of coil
8. Insufficient charge	9. Reclaim, evacuate, recharge per nameplate

Problem	Remedy
Compressor starts and runs, but fan does not run.	
Possible cause	
1. Faulty switch	1. Replace
2. Open fan motor coil circuit	3. Replace
4. Fan binding on shroud or venturi ring	5. Adjust fan mounting

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